

ABSTRACT

A method and apparatus are provided for humidifying fuel, and optionally oxidant, supplied to a fuel cell system, which can be a single fuel cell or a multiplicity of fuel cells. A catalytic reactor is provided, which is supplied with a portion of the fuel and the oxidant. The fuel is supplied in excess of the oxidant to the catalytic reactor, so as to generate a stream of fuel which is both heated and humidified. For a closed system, a heated and humidified fuel flow, and optionally a heated and humidified oxidant flow, are mixed with additional flows of these gases supplied to the fuel cell.